

ONTARIO UNIVERSITIES:

**GOING
GREENER
REPORT
2012**







EXECUTIVE SUMMARY

04

INTRODUCTION & BACKGROUND

05

LEADERSHIP & ENGAGEMENT

07

University policies	07
Budget and investment	08
Dedicated staff and multi-stakeholder groups	08
Student engagement	09

OPERATIONS & FACILITIES MANAGEMENT

11

Energy and emissions	11
Sustainable and energy-efficient buildings	13
Transportation	16
Waste reduction	17
Water consumption	19
Sustainable and energy-efficient procurement	19
Food initiatives	19
Green cleaning programs	20

TEACHING & LEARNING

22

Undergraduate and graduate education	22
Research	23

PARTNERSHIPS & AWARDS

25

Partnerships	25
Awards	25

CONCLUSION

26

Sustainability: an ongoing effort	26
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■ EXECUTIVESUMMARY

In 2012, Ontario universities continued to make progress on environmental sustainability despite the challenges of budgetary restraints. This is a testament to the commitment of university leaders, sustainability offices and campus communities around the province.

This report is the fourth in an annual series produced in fulfillment of the 2009 Ontario University Presidents' Pledge to report on operational and academic activities that support environmental sustainability. Based on a survey of all 20 Ontario universities (22 campuses), the report features new initiatives undertaken in 2012. Among the highlights of the report are the following:

- Students drove the adoption of greener policies and practices, and continue to play a large role through a wide variety of institutional and student-led activities.
 - Two-thirds of campuses in Ontario now have staff dedicated to environmental sustainability.
 - Eighty-two per cent of campuses now track the cost savings associated with environmental initiatives.
 - The majority of Ontario university campuses have begun measuring their emissions and energy consumption. All universities will do so by the July 2013 deadline of the *Green Energy and Economy Act*.
 - Eighty-six per cent of universities have adopted green standards for new buildings and retrofits, while over 77 per cent have green roof or cool roof systems, and 73 per cent have a centralized control system to monitor energy use in buildings.
 - Virtually all campuses offer protected bike racks, 86 per cent offer free or discounted transit passes for students and many also offer a car-pooling program. Seven campuses also increased their fleet of hybrid/electric vehicles in 2012.
 - Universities have become much more conscious of water consumption in recent years and the latest findings show that over 85 per cent of Ontario university campuses have installed low-flow toilets, low-flow shower heads and low-flow faucets.
- The majority of universities have taken steps to improve the sustainability of food services and local food availability on campuses.
 - Universities continue to expand academic offerings in this area—15 of 22 campuses have introduced new environment-related courses in the past year.
 - In 2012, universities received 23 awards for environmental sustainability (not counting certifications for green buildings), up from 16 in the previous year.





■ INTRODUCTION & BACKGROUND

Report purpose

In 2009, the Executive Heads of Ontario universities signed a sustainability pledge, called Ontario Universities: Committed to a Greener World.

Through this pledge, universities dedicated themselves to seeking solutions to the challenges of environmental sustainability, sharing knowledge about sustainability and climate change, and incorporating green initiatives into their operations. The pledge also committed all institutions to developing sustainability plans with measurable objectives and reporting requirements.

Survey scope and methodology

A survey questionnaire was developed in 2009 to solicit information on university sustainability. The questionnaire was revised in response to feedback from campus stakeholders and now focuses on the following major areas:

- Policies and resources
- Student engagement
- Operations and facilities management:
 - Energy use and emissions
 - Green building standards
 - Transportation initiatives
 - Waste reduction
 - Water conservation
 - Sustainable procurement
- Teaching, learning and research
- Partnerships and awards

Survey responses are gathered from university representatives and the COU Secretariat analyzes the responses and produces the report. This year, for the first time, all 20 universities (22 campuses) provided completed questionnaires.



University policies

In addition to the 2009 Presidents' Pledge, two-thirds of Ontario universities have made formal declarations of commitment to environmental sustainability. An increasing number of universities now conduct campus-wide sustainability assessments, boosting the majority that do so from 52 to 59 per cent. The following are some examples of Ontario universities' policy initiatives:

- Several universities, including **McMaster University** and **Queen's University**, have adopted Climate Action Plans with targets for energy conservation, waste reduction and transportation emissions.
- Similarly, **Nipissing University's** new Sustainability Team is developing a carbon and water footprinting exercise.
- **OCAD University** is developing a Sustainability Master Plan and has undertaken a restructuring of its Sustainability Office to support the plan.
- **Carleton University** has worked with Green Globes (a system for green building design, operation and management) to develop and pilot-test a campus assessment tool, which has now been adopted by APPA: The Association of Higher Education Facilities Officers.
- **York University** partnered with the City of Toronto to produce a Secondary Plan (supplementing the City's Official Plan) guiding sustainable development. The Plan requires a "net environmental gain" for all land developments on campus.
- **Lakehead University** has committed to build its entire new Orillia campus to LEED standards. (LEED stands for Leadership in Energy and Environmental Design, an international green design benchmark that is upheld in Canada by the Canada Green Building Council.)

Budget and investment

Twelve Ontario university campuses had dedicated budgets for sustainability initiatives in 2012 (up from nine universities in 2011 and six in 2010).

"Going greener" often means investing resources upfront, but usually pays dividends down the road in energy and water use reductions. In Ontario, 82 per cent of campuses now track the cost savings associated with environmental initiatives.

Dedicated staff and multi-stakeholder groups

Two-thirds of university campuses in Ontario now have staff dedicated to environmental sustainability. Four university campuses increased their human resources' capacity on sustainability in 2012 by at least one FTE: the **University of Guelph**, **McMaster University**, **OCAD University** and the **University of Windsor**.

Windsor also established the new position of Environmental Advocate, and provides a budget and reduced teaching load for this Advocate (a faculty member) to work to make the university a more ecologically responsible institution.

The **University of Guelph** and the **University of Ontario Institute of Technology** now have multi-stakeholder groups to promote environmental sustainability on campus. Now active on 20 campuses, these groups are a key mechanism for involving students, faculty and support staff in generating ideas, and making decisions about "greening" campuses.



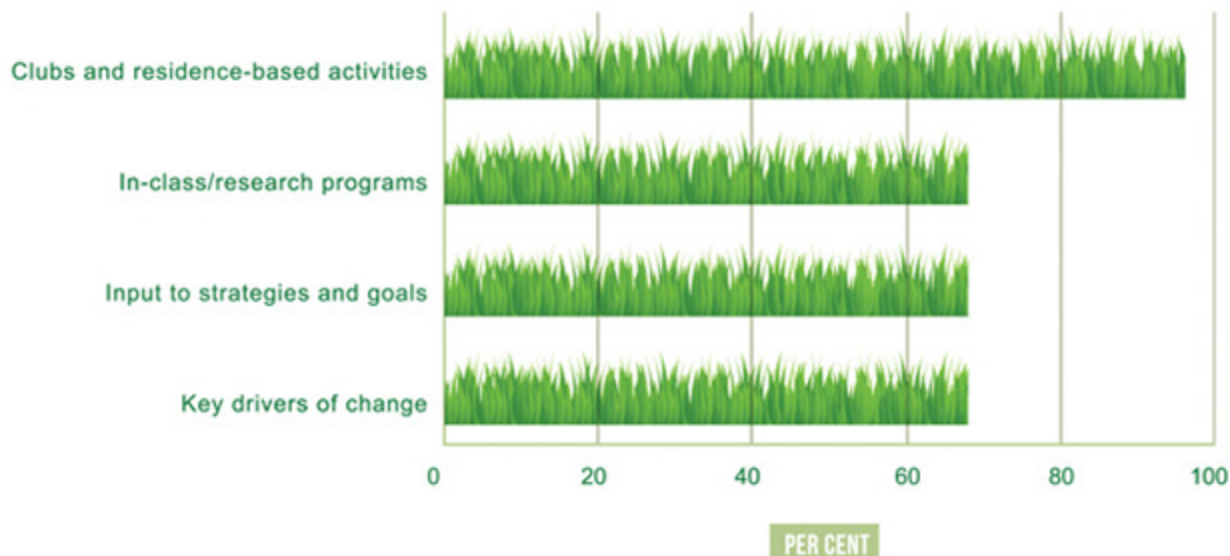
Student engagement

It was student commitment to environmental sustainability that led to Ontario universities' adoption of greener policies and practices, so it stands to reason that students remain key drivers of change on campus. Ontario universities have responded by providing meaningful opportunities to help solve their institutions' sustainability challenges through coursework, research, institutional decision-making processes, clubs, volunteering and residence life. Widespread student-oriented and student-organized activities include orientation week, support to clubs, Sustainability Ambassador programs, RecycleMania, Res Race to Zero and the Commuter Challenge. The following are highlights of student engagement in environmental activities at Ontario campuses:

- **Brock University** holds a student competition to determine best ways to spend the student environmental levy, which is collected each year with tuition.
- **Carleton University** worked with its student government to bring composting to the food court in the student-union-run University Centre. It also engaged students in an energy audit, conducted in partnership with Hydro Ottawa.
- Students at the **University of Guelph** held a Retrofit Referendum in 2007 and agreed to contribute \$5 million over 12 years via a student levy to an Energy Conservation Fund. Since then, students have contributed more than \$400,000 per year—voting in two referenda to pay \$10 per student per semester—with the university providing matching funds.
- **Laurentian University** engages students through the Residence Complex Recycling committee, which has undertaken promotional activities focusing on water and energy conservation, recycling programs, waste reduction, and on and off-campus green space clean-ups.
- **McMaster University** worked with the McMaster Student Union's MACgreen to reduce waste by developing a dish-lending program for student events.
- The **Ryerson University** Student Union spearheaded a multi-year campaign to create a pedestrianized zone in the middle of campus. Early in 2012, Toronto City Council granted the zoning change and soon after, "Ryerson Square" was created—a public space where students have held numerous events, including a weekly summer farmer's market.



HOW STUDENTS DRIVE SUSTAINABILITY ON CAMPUS



- At the **University of Toronto St. George** campus, students are offered paid, volunteer and course-credit work opportunities via the Sustainability Office, where they support "Rewire" and "Start Green" (energy-conservation programs for student housing) as well as "Paper Cuts" (a paper-reduction program for libraries, offices and courses).
- At **Trent University**, students in a waste-management course participated in finding solutions to real-life situations in a course jointly run by a faculty member and the Sustainability Office, in partnership with local government and organizations.
- The **University of Waterloo** engaged students in design competitions for the gardens and green roof of the new Environment 3 building, as well as the South Campus entrance.
- Western University** recently revamped its sustainability website and continues to offer lunch-and-learn sessions for residence sustainability champions, as well as offering students "green tours" of LEED buildings and the recycling process.

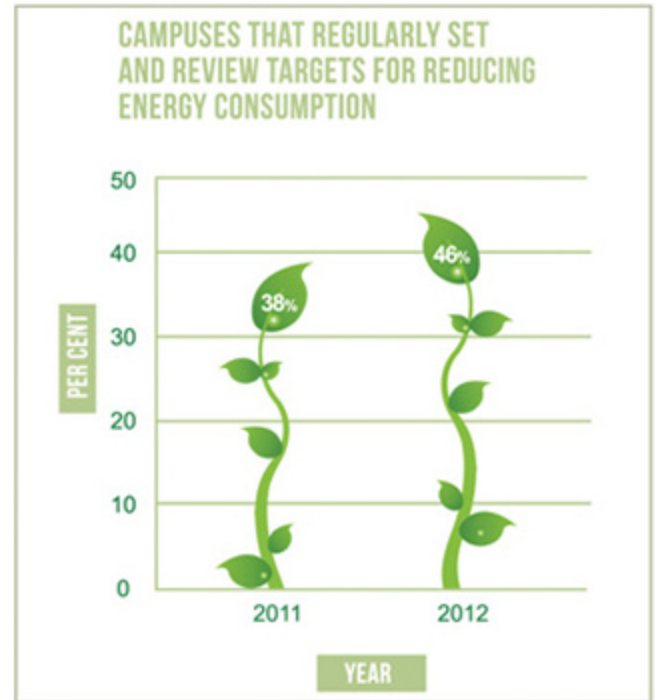
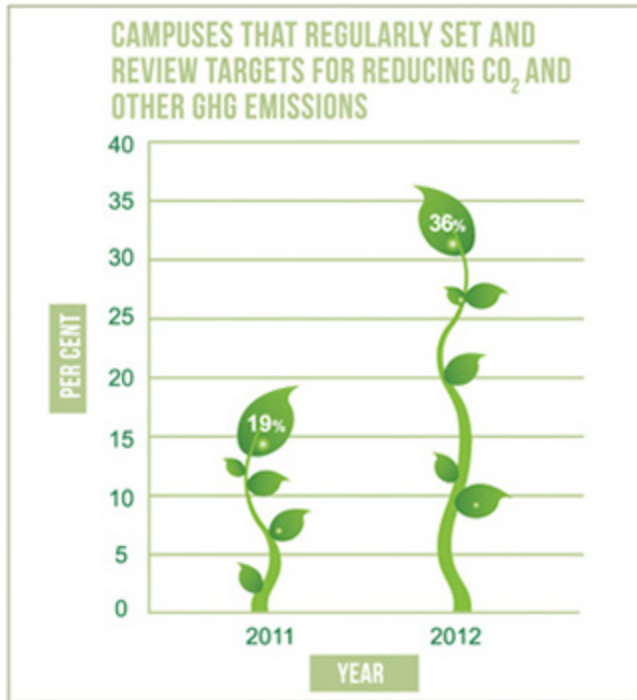
As these highlights of student engagement demonstrate, Ontario universities have undertaken a wide and creative array of activities to involve students in making universities more sustainable.



OPERATIONS & FACILITIES MANAGEMENT

Energy and emissions

The majority of Ontario university campuses have begun measuring their emissions and energy consumption. All universities will be required to do so under the Green Energy and Economy Act beginning in July 2013. As the accompanying graphs show, many have moved beyond measurement to target-setting on both greenhouse gas emissions and energy conservation in the years following the Presidents' Pledge. Whether through campus education, better building design, and/or increased reliance on renewable energy sources, many universities have successfully reduced or held steady their use of fossil fuels even through a period of significant growth.



For example, in 2012 **Algoma University** partnered with the Sault Ste. Marie Public Utilities Commission and Superior Energy Solutions to install a \$1.1 million, 540-panel solar power system on the roof of the George Leach Centre. The new solar system produces clean energy for the grid, and reduces negative emissions from the Centre equal to the carbon dioxide created by cars driving over 12 million kilometres.

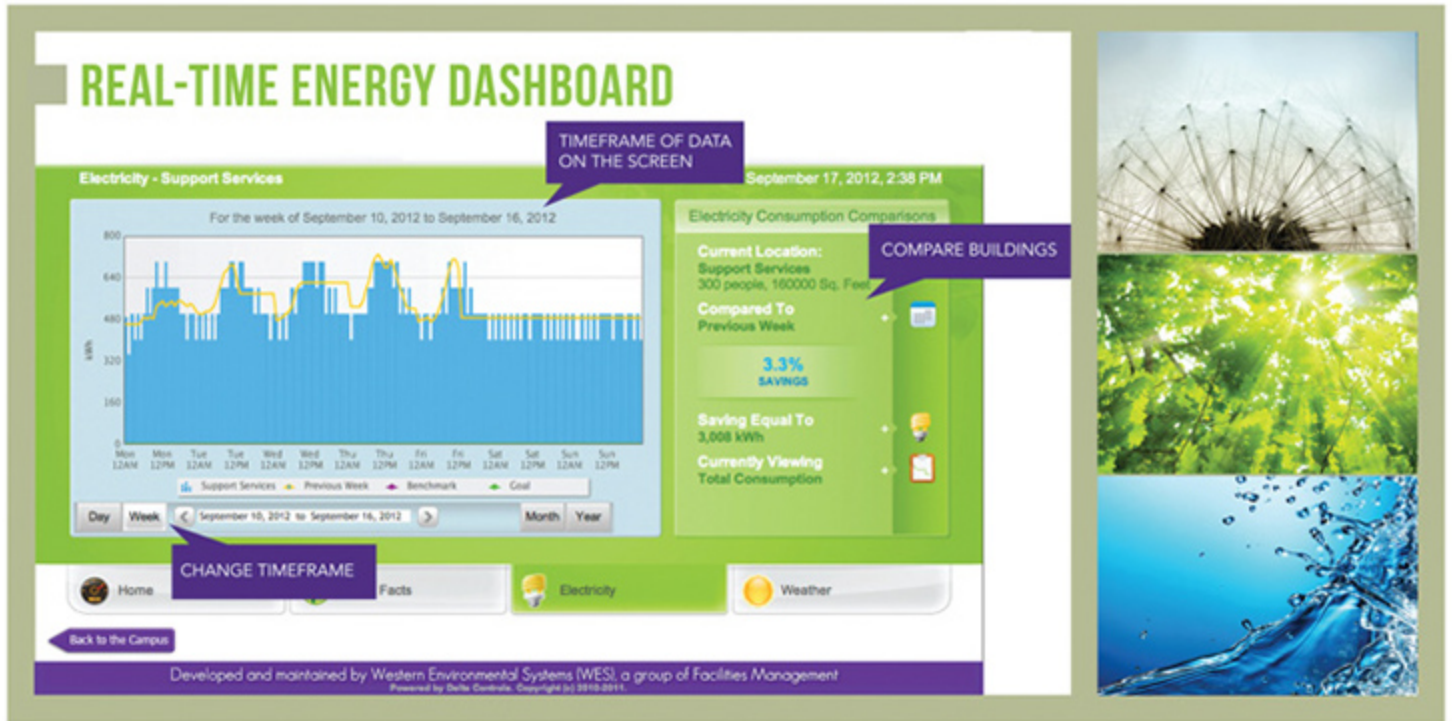
Carleton University entered into a large-scale, multi-year agreement with Honeywell to conduct detailed audits of each of the 44 buildings on campus, and to develop specific recommendations for energy-conserving improvements for each one.

Lakehead University began generating its own geothermal energy in 2012.

Trent University sustainably generates 33 per cent of its own energy via an on-campus hydro-electric station. In 2012, upgrades began on the 100-year-old hydro station that will increase the campus system's output from 2.4 MW to 3.9 MW.

The **University of Ontario Institute of Technology** has a well-developed sustainable energy generation program, and now generates 30 per cent of its heating energy through geothermal production.

McMaster University and Western University have developed comprehensive utilities dashboards that show real-time use of resources.



Western University has now launched its Real-Time Energy Dashboard that displays electricity use in all buildings across campus. Campus stakeholders can obtain a snapshot of campus-wide energy demand at any given time, and they can access data for any building's energy use for any unit of time. Currently set up to show electricity use for all 90 buildings on campus, the dashboard will eventually incorporate water, natural gas and possibly steam use.

McMaster University's Utilities Dashboard is a customized electronic reporting tool designed to help manage consumption of utilities, transportation fuel, waste and carbon emissions. With the help of a civil engineering student, an existing electronic metering system (originally developed by Schneider Electric) was adapted and refined. The system now allows for manipulation of system data into charts, reports and forecasts. Waste data was gathered in partnership with BFI, the campus' waste services provider, and uploaded into the system. The fuel-pump data monitoring system is in the process of being refined, and vehicle-level fuel data will be added in the future.

Both dashboards are helping campus communities learn about resource consumption and how to contribute towards their annual sustainability goals.

Sustainable and energy-efficient buildings

Universities use a process called "building commissioning" to provide assurance that the structure and systems of new buildings live up to stringent environmental and quality standards. **Queen's University** has begun a new internal commissioning program for all new buildings on campus. This process has increased the efficiency of building systems.

The vast majority of universities in Ontario (86 per cent) have adopted green standards for new buildings or retrofits. Over three-quarters (77 per cent) have green-roof or cool-roof systems, 73 per cent have a centralized control system to monitor energy use in buildings, and 64 per cent measure indoor air quality in their buildings.

The **University of Waterloo's** Environment 3 building opened for classes as the first LEED Platinum certified building on an Ontario university campus. The 57,000-square-foot building features extensive insulation, high-efficiency lighting, in-floor heating recycled from computers, rainwater recycling systems, a large photo-voltaic array, and a native-species green roof/garden that serves as a relaxing space for students, staff and faculty.



The **University of Ottawa** recently opened its new 15-storey, 11,700-square-foot Social Sciences Building, expected to be certified as LEED Gold. Located close to bike paths and transit stations, the building was constructed using recycled, locally extracted/manufactured materials. Eighty per cent of its heating needs are met using heat from a computing/data centre (with surplus heat exported to nearby buildings). The building was designed to consume 50 per cent less energy than that permitted by code, and it features a green roof, drought-tolerant grounds and a living wall air-filtration system.

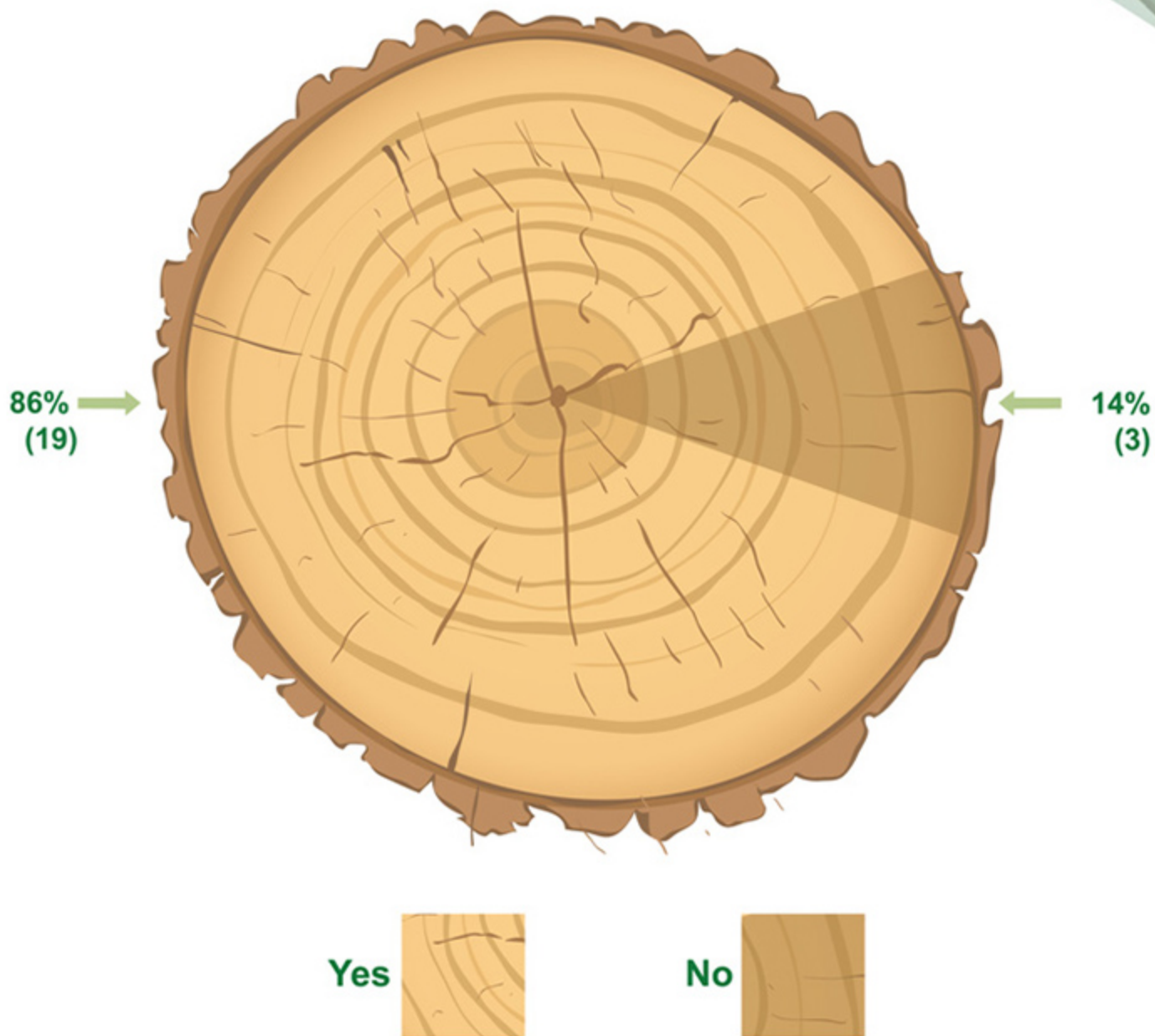
Algoma University's new Essar Convergence Centre has been designed to LEED Gold standards and is awaiting certification. The centre supports education, research, and development in biosciences and technology. Aside from teaching and research labs, the centre houses the Sault Ste. Marie Innovation Centre, the Algoma Games for Health (a design studio that unites computer gaming technology with health care and rehabilitation) and the Invasive Species Research Institute.

The **University of Toronto Mississauga** received LEED Silver certification for its new Instructional Centre in 2012. The building has a solar array and a touch-screen dashboard, so users can see real-time energy and water use in a number of buildings. The dashboard also provides information about environmentally sustainable features of campus' buildings, including the LEED ones.

Built to be **University of Guelph's** first LEED-certified building, the Ontario Veterinary College's Primary Healthcare Centre (PHC) was recently opened. With highly efficient plumbing, mechanical and energy systems in place, the building is targeted to save 111.3 tons of greenhouse gas emissions per year compared to standard construction methods. The building's transit access, bicycle racks, nearby showers/change-rooms and limited parking promote sustainable transportation. The new Biodiversity and Pathobiology buildings have been built to LEED Silver standards and are also awaiting certification.



CAMPUSES THAT HAVE GREEN STANDARDS FOR NEW BUILDINGS OR RETROFITS

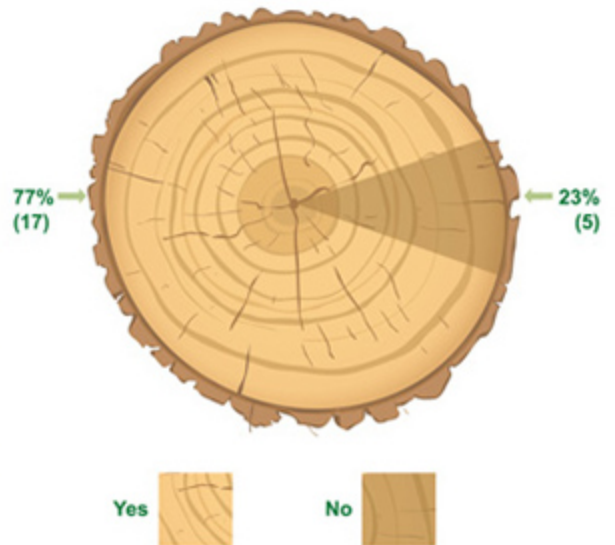


During hot weather, buildings with dark, non-reflective roofs (the conventional North American approach) absorb significant heat through their roofs, driving up air-conditioning costs. Roofs using materials that increase the reflectivity of roof surfaces are known as "cool roofs", while roofs that have been planted with vegetation are known as "green roofs". Over the past few years, many universities—now amounting to three-quarters of all campuses—have implemented cool-roof and green-roof systems.

At the **University of Toronto Mississauga** campus, 40 per cent of roofs are green or cool, and at the **Scarborough** campus, an estimated 75 per cent of roofs are green or cool. **York University** has implemented green or cool roofing on 20 per cent of its surface area, and 100 per cent of all new construction on campus has green roofs.

At **McMaster University**, the Student Union is leading a Green Roof Initiative that aims to create a green space on the terrace of their University Student Centre. Results from a recent campus consultation will be integrated into the planning of the space, ensuring design aligns with the vision put forth by members of the university community.

CAMPUSES WITH GREEN ROOFS OR COOL ROOF SYSTEMS ON BUILDINGS



Living walls

A relatively new design feature, living walls or "green walls" are gardens built indoors or outdoors, with plants attached to a vertical surface. Outdoors, these walls can reduce noise pollution and provide access to greenery in an urban space. Indoors, they improve air quality and reduce the need for HVAC systems to bring in fresh air from outdoors—air that takes energy to be cooled or heated. Living walls also remove toxins, increase oxygen and moisture in the air, and provide psychological benefits for building users. In the past year alone, three Ontario universities have installed new living walls in their campus buildings:

- 🌿 **Nipissing University** has installed living walls in both its Athletics and its Residence buildings.
- 🌿 In its new Environment 3 building, the **University of Waterloo** has installed a living wall that is connected to the HVAC system.
- 🌿 The **University of Ottawa's** new Social Science Building includes a five-storey indoor living wall composed of a wide variety of plants. The wall acts as the building's air filtration system.



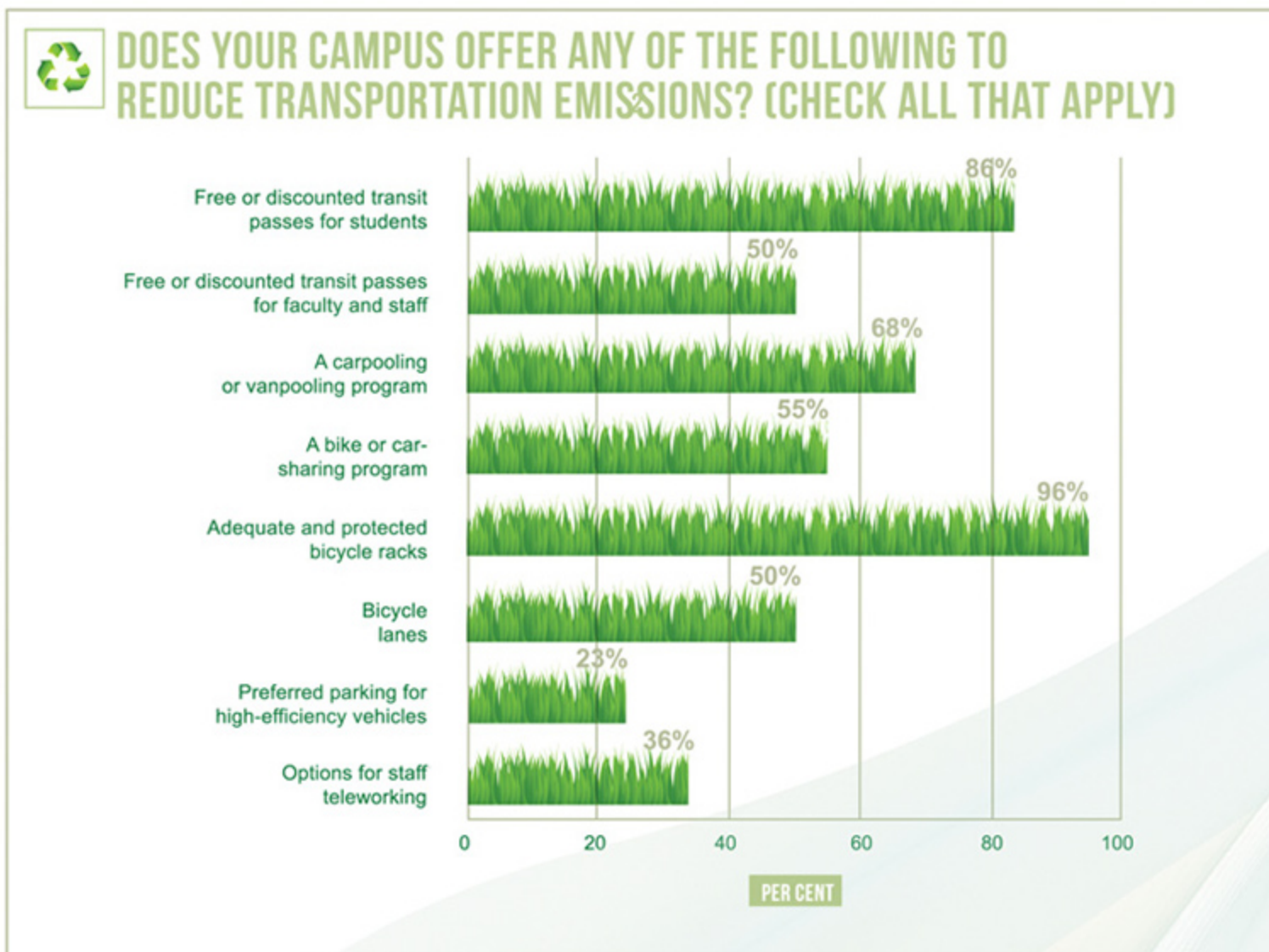
Transportation

The vast majority of Ontario's universities have invested in infrastructure and programs to reduce transportation emissions. Virtually all campuses (95 per cent) offer protected bike racks, 86 per cent offer free or discounted transit passes for students, and 68 per cent also offer a car-pooling program. Seven campuses also increased their fleet of hybrid/electric vehicles in 2012.

The **University of Toronto Scarborough** runs a BikeShare program, an ecoPark program (for electric/hybrid vehicles) and a carpool tool. Its fleet of police cars is composed of hybrid vehicles, and parking services operate a SmartCar.

At the **University of Toronto St. George**, the Bikechain program offers free bicycle repair, bike rentals (free to students) and a cycling education centre. It employs work-study students to provide cyclist-commuters with a bike repair service, logging over 4,000 service visits each year. The bicycle lending service operates at full capacity during high season.

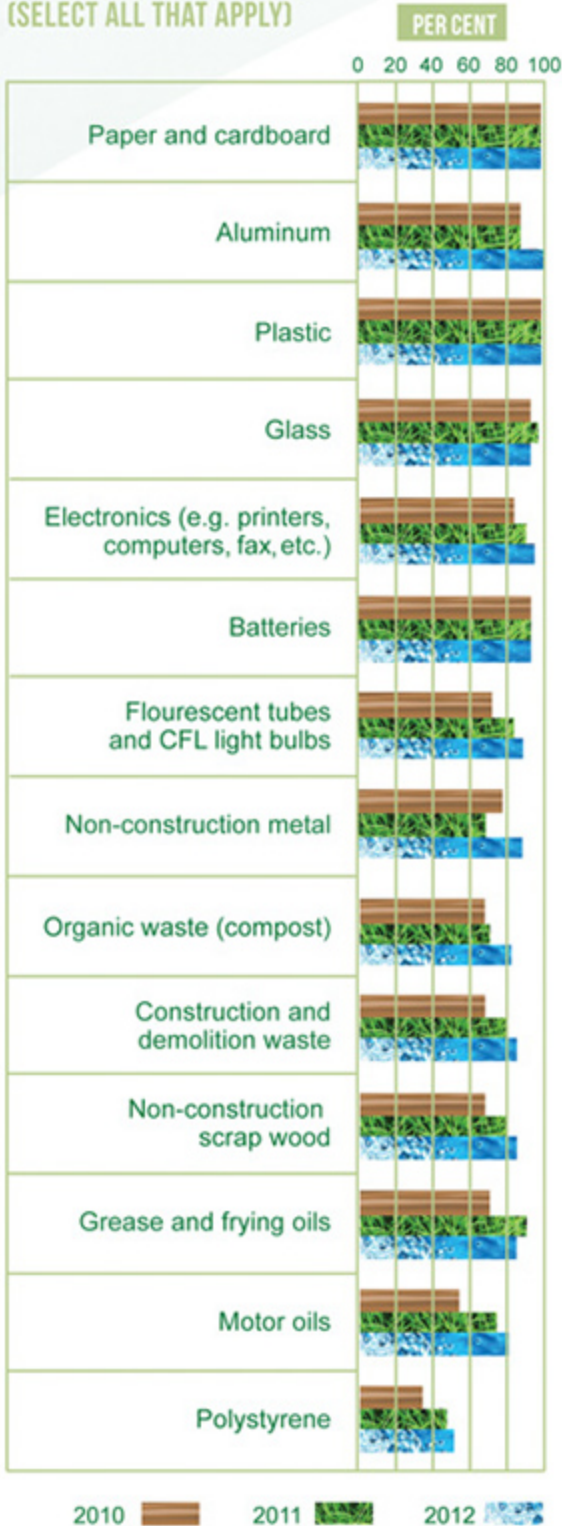
This year, **Wilfrid Laurier University** was awarded third place in the Commuter Challenge among large organizations across Ontario, while **Queen's University** contributed significantly to the City of Kingston's top rank in the Commuter Challenge for cities of similar size.





PLEASE INDICATE WHICH ITEMS YOUR CAMPUS COLLECTS FOR RECYCLING OR SPECIALIZED DISPOSAL (SELECT ALL THAT APPLY)

ITEMS



Waste reduction

All Ontario universities have comprehensive recycling programs in place and new streams are introduced regularly. Collection systems for paper, cardboard, aluminium and plastic are universally available, while over 85 per cent of campuses also recycle glass, construction waste, scrap wood, metals, electronics (e.g. printers, cell phones), batteries, light bulbs and cooking oils. Over 80 per cent of campuses have now introduced composting systems for organic waste.

The following are some highlights of university initiatives to reduce waste in 2012:

- Brock University** held its first Waste Reduction Week.
- Three Ontario universities (**University of Guelph, University of Ottawa and Queen's University**) participated in the Canadian-American "RecycleMania 2012" competition.
- University of Guelph** started a pilot composting program for its cafeterias, and expanded its compostable tableware offerings to include single-use cutlery and beverage cups. Campus members can also take out their meals on china dishes, with daily pick-up in all residences.
- Lakehead University** developed a plan for the installation of an organic waste conversion system in its main café operations.
- McMaster University** developed a best-practice guide for hosting waste-free events. Approval for student events now includes standard questions about sustainability. The campus also expanded its compost and electronics recycling programs this year.
- Students at **OCAD University** led a campaign to reduce the use of disposable tableware in the nearby food court.
- Food & Beverage Services at the **University of Toronto St. George** began offering an Eco-Tray program for campus members. For a one-time \$5 fee, members are served meals in reusable containers and can bring back their containers to be washed and reused. Overall, St. George campus increased its waste diversion rate from 66 to 71 per cent in the past year.
- Trent University** expanded its compost program this year. In total, it processed 86 tonnes of compostable material in the past year, in part by targeting single-use cups at major events.

Free-cycling

Free-cycling has been a longstanding feature of campus life, as any student knows who has picked up a perfectly good couch from the curb in April. As part of the second-hand economy, free-cycling is inherently sustainable as it allows goods to be used many times over, instead of using resources to make new consumer goods while sending used ones to landfill sites.

Three universities reported in 2012 that they have helped to institutionalize free-cycling on campus:

- 🕒 **York University** runs "Free Stuff" tables in each undergraduate residence during the year-end move-out period. At the end of the year, all remaining items were donated to a clothing bank. Over 1,700 kg of clothing, household items, books and electronic items were collected during the 2012 move-out period—40 per cent more than the previous year.
- 🕒 The **University of Ottawa** now has a permanent "Free Store" and has expanded its program to make the year-end residence move-out more sustainable.
- 🕒 The **University of Toronto St. George** campus operates a "Swap Shop", where campus community members can drop off and pick up items like furniture and office equipment throughout the school year. At year-end, the Shop closes with a benefit sale for charity.

Reducing the sale of single-use water bottles on campus

Eight Ontario campuses have targeted an unnecessary source of waste that is relatively easy to eliminate: the single-use plastic water bottle that provides water of similar quality to tap water—but is much more costly to produce—and that often winds up in garbage bins or polluting the natural environment.

At **Nipissing University**, students have led a water-bottle reduction campaign, resulting in the increased availability of water-bottle filling stations on campus and a recycling advertising campaign. The **University of Toronto** (all three campuses), **Trent University**, **Carleton University**, the **University of Ottawa** and **Queen's University** have all implemented campus-wide bans on the sale of single-use water bottles, in conjunction with improved availability of water-bottle filling stations and campus education campaigns.



Water consumption

Universities have become much more conscious of their water consumption in recent years, and by 2012, over 85 per cent of Ontario university campuses had installed low-flow toilets, low-flow shower-heads and low-flow faucets. A significant proportion had also converted water-cooled equipment to air-cooled (64 per cent) and implemented efficiencies in chilled water systems (50 per cent).

The **University of Toronto St. George** campus installed a centralized irrigation-control system that uses weather-based data to assess and carry out the irrigation needed for each area on campus. The following universities also installed new grey-water and/or rain-water recycling systems to support water conservation:

- ① **Brock University**
- ① **Laurentian University**
- ① **University of Toronto Mississauga**
- ① **Trent University**
- ① **University of Waterloo**

Sustainable and energy-efficient procurement

The majority of university campuses in Ontario have instituted sustainability standards for goods and services procured from external suppliers, and energy efficiency is required by 59 per cent of campuses in their purchasing contracts. The following are a few notable procurement highlights from the 2012 survey:

- ① The **University of Ontario Institute of Technology** is one of eight campuses whose procurement requirements now include a local sourcing component.
- ① At **York University**, a joint "Green IT" initiative between information technology (IT) and procurement services has resulted in the move to virtual servers. This transformation has exponentially reduced the number of servers in use—along with the electricity and HVAC resources required to run them.
- ① **McMaster University's** recently-updated Sustainable Procurement Guide now provides guidance not only for central purchasing, but also for campus members to use in their professional and personal purchasing. The guide includes information on sustainable procurement, questions to consider, and a list of relevant eco-logos or certifications.

Food initiatives

Food sustainability takes into account the entire cycle of food production, transportation, storage, preparation and waste. Local production reduces the transportation-related carbon footprint of the foods we consume. But beyond that, sustainability addresses food production standards (including pesticide use), labour standards, native habitat preservation, animal welfare and on-farm energy use. The majority of Ontario universities have taken steps to improve the sustainability of food services and local food availability on campus. "Buy local" initiatives have reduced the food-miles of campus meals, and the recognition of fair-trade certification for goods such as coffee and chocolate has ensured that food from other jurisdictions is also produced as sustainably as possible.

The following initiatives and milestones took place in 2012:

- ① In summer 2012, the **University of Guelph** sourced organic produce from the on-campus Guelph Centre for Urban Organic Farming. The university's produce purchases are currently 45 per cent local in season. It was also recently certified by Fair Trade Canada as the first fair-trade campus in Ontario.
- ① The **University of Ottawa** is also in the process of becoming Fair Trade Canada certified.
- ① The **University of Toronto** purchased approximately \$300,000 worth of local food last year. It is also one of the first institutions to be certified by Local Food Plus (LFP), a non-profit organization that certifies practices for local production and sustainability.
- ① At **Wilfrid Laurier University**, Food Services have adopted a set of standards to offer and promote sustainable and fair trade food options. These standards include sustainable food, waste management, and campus education and engagement. Produce is purchased locally or within Ontario when possible, and eggs are certified cage-free.

Farmers' markets and community gardens on campus

Offering both affordable, fresh produce and an opportunity to interact directly with local food producers, farmers' markets are a good way to foster participation in sustainable food systems. Four Ontario universities (**McMaster University, the University of Guelph, Queen's University and York University**) have worked with local producers to introduce farmers' markets to their campuses.

Designed to bring people together in a common project, community gardens provide opportunities for student learning and engagement, for increasing access to local produce, and for raising public awareness about food sustainability. **Ryerson University** has engaged its students in the development of its HomeGrown Community Garden, which celebrated its second growing season this year. Nine other university campuses also reported having community gardens in 2012.



Green cleaning programs

Algoma University has had a certified "green cleaning" program since 2009, when custodial plant staff spent a year testing products to ensure both quality and sustainability. It was the first educational institution in Northern Ontario to receive certification. Green cleaning programs aim to eliminate toxic chemicals and corrosive materials and to reduce the volume of waste produced in the cleaning process.

A total of 19 university campuses reported having green cleaning programs in 2012.



■ TEACHING, LEARNING & RESEARCH

Beyond 'greening' university operations, the Presidents' Pledge committed universities to integrating sustainability into their institutions' core missions: teaching, learning and research. Across a wide range of disciplines, Ontario universities have shown leadership in developing programs designed to address environmental issues in order to prepare students for the "green economy" and for the task of building a more sustainable society.

Undergraduate and graduate education

Courses

In response to student demand and universities' commitment to developing solutions to sustainability issues, the vast majority of Ontario campuses now offer undergraduate courses related to environmental sustainability in the physical sciences (19 campuses out of 22), social sciences (18 campuses), natural sciences (17 campuses) and humanities (17 campuses). Twelve campuses offer related undergraduate courses in health sciences and engineering, nine offer environmental courses in teacher education, and six offer related courses in architecture and design. New courses are constantly coming on-stream as research evolves and interest grows: in the last year alone, 15 of 22 campuses introduced new environment-related courses.

At the master's level, about half of Ontario's universities (11 campuses) offer sustainability-related courses in natural, physical and social sciences, while master's courses in humanities (10 campuses), engineering (8 campuses), and architecture and design (6 campuses) are also frequently available. Doctoral courses are most commonly offered in the natural sciences (9 campuses) and physical sciences (8 campuses).



Degree programs

Across Ontario, students can now register in a sustainability-related undergraduate major at 16 Ontario university campuses, or a minor at 15 campuses. At the graduate level, there are master's level degree programs related to sustainability at 12 universities and doctoral level programs at 11 campuses.

In the past year, Ontario universities reported adding nine new degree programs with a focus on sustainability, with additional programs in development.

- 🌱 **Brock University** introduced new sustainability-focused undergraduate and master's programs in health sciences.
- 🌱 **Laurentian University** now offers a bachelor of science program in environmental sciences and master's and doctoral level engineering studies in environmental sustainability.
- 🌱 **Trent University** recently welcomed the first cohort of students to its new Sustainable Agriculture and Food Systems program.
- 🌱 **Wilfrid Laurier University** has launched a new undergraduate major and a master's program focused on sustainability.
- 🌱 The **University of Ottawa** has just created a new collaborative master's program in sustainability.
- 🌱 The **University of Ontario Institute of Technology** has plans to develop an undergraduate major related to sustainability.



Research

Ontario universities conduct a significant amount of research on issues related to environmental sustainability. The following are a few examples of new research institutes or major research projects developed or funded in the last year:

At **Brock University**, the Environmental Sustainability Research Centre received a \$2.3 million grant from the Social Sciences and Humanities Research Council for its Water Economics Policy Governance Network. Two grants (totalling \$110,000) from the WaterSmart Incentive program are enabling five faculty members and their students to conduct world-class research that will lead to improved water use in Canada and internationally.

Carleton University has developed a laboratory for Smart Grid Technologies research in partnership with Hydro Ottawa. The lab enables researchers and students to learn about and experiment with “smart” electricity infrastructure and sustainable energy sources, and thereby contribute towards increasing the efficiency and reliability of our energy supply.

At **Lakehead University**, the Biorefining Research Institute (BRI) continues to grow. The biorefining process transforms forest and agricultural biomass into useable bio-products and bio-fuels. In 2012, BRI gained a Tier 1 Canada Research Chair in Biorefining and Bioenergy Processes, and the Institute co-hosted the inaugural BioFor Conference with the Centre for Research and Innovation in the Bio-Economy.

OCAD University has incorporated environmental sustainability topics (Urban Ecology, Bio-inspired Design and Sustainable Materials and Product) into its draft Research Plan. The university is also planning a conference on Urban Ecology.

The **Queen's University** (RBC) Water Initiative is a \$2 million, 10-year program that takes a holistic approach to understanding the fragility of watershed resources. This new initiative aims to raise awareness of the impact of industrial development and agriculture on watershed health.

Ryerson University's Centre for Urban Energy (CUE) was created through a partnership with Hydro One, Toronto Hydro and the Ontario Power Authority. With funding of \$16 million over five years, CUE will tackle short and medium-term energy challenges facing urban populations. One of its first projects involves the system integration of large-scale energy storage using lithium batteries.

A **University of Toronto St. George** campus researcher has undertaken a collaborative cycling-adoption study to test best practices that encourage cycling as a means of transportation. Researchers on St. George campus are also working with area hospitals and other members of the Green Health Care Alliance on green health care research.

The **University of Windsor** has launched a Freshwater Fish Conservation Centre to support conservation and breeding programs for endangered species of fish. The university has also received \$1 million under the Automotive Partnership Canada for the development of a hybrid electrohydraulic-hydronechanical drawing process for the production of lightweight automotive parts, intended to reduce vehicle weight and improve fuel efficiency.

Supported by a \$2 million Social Sciences and Humanities Research Council partnership grant (2012-2019), **York University** and **Lakehead University** have partnered with the University of Saskatchewan to create a Sustainability and Education Policy Network (SEPN). Spanning primary to postsecondary education, SEPN will investigate promising policies and innovations for enabling educational change in support of a more sustainable future, including curriculum design, research, facilities operations, governance and community engagement.



PARTNERSHIPS & AWARDS

Partnerships

A key element of the Presidents' Pledge was a commitment to working in partnership with governments, the public, businesses and others in the academic world to advance environmental sustainability. In 2012, Ontario universities reported undertaking dozens of environmentally focused partnership projects with other educational institutions, as well as the public, private and non-profit sectors. The following are some of the highlights:

The **University of Toronto Scarborough** campus partnered with Evergreen, the Toronto and Region Conservation Authority, and Livegreen Toronto to host the first annual Eastern GTA (Greater Toronto Area) Eco Summit in March 2012. Organized for environmental groups, residents, the private sector, media and students in the region, the summit was designed to harness passion for the environment in the region and translate ideas into a local environmental agenda.

Under the banner "Team Ontario", students and faculty advisers from **Queen's University**, **Carleton University** and Algonquin College have been accepted into the finals of a highly competitive Solar Decathlon organized by the U.S. Department of Energy. Team Ontario has taken up the challenge to create a "net zero" house (one that produces as much energy as it consumes) to be judged in October 2013. The winner will be chosen on the basis of affordability, appeal and design excellence (including energy efficiency and production). The \$1-million ECHO project is being constructed at Algonquin College and will be transported to California for the competition. The design includes energy stored in hot water (rather than more conventional batteries), vacuum-insulated panels and a predictive HVAC system.

Researchers at the **University of Toronto St. George** campus received a six-year, \$1.65-million Natural Sciences and Engineering Research Council grant for the "Distributed Generation for Remote Communities" project, which will bring clean energy technologies—and the skills to use them—to remote Aboriginal communities that currently rely on diesel generators.

Trent University has worked closely with a new organization, called Sustainable Peterborough, to help develop a community framework for a collaborative, local approach to sustainability in the Greater Peterborough Area.

Western University is an active member of ReForest London, and contributes towards London's Million Tree Challenge (which inspires Londoners to plant one million trees over the next 10 years). The university is also active in the London Electric Vehicle Acceleration Group, designed to speed up the adoption of electric vehicles in London.

Awards

External awards demonstrate the progress and leadership of universities on environmental stewardship. Ontario universities reported receiving 23 awards for their environmental sustainability practices, not counting certifications for green building design, up from 16 reported in 2011. The following are some highlights of the awards reported:

- York University and the University of Ottawa were listed in the top 20 of 178 universities ranked on sustainability by UI GreenMetric World University Ranking.
- The University of Toronto was recognized as one of Canada's Greenest Employers 2012.
- The Friends of the Greenbelt Foundation recently named the University of Guelph's Hospitality Services as one of 2012 Ontario's Local Food Champions.
- Ryerson University won a bronze award from the Recycling Council of Ontario for waste minimization.
- Queen's University won the Kingston Hydro Conservation Award.





CONCLUSION

Sustainability: an ongoing effort

The progress demonstrated by Ontario universities over the past few years is a testament to the commitments made by university leadership, students, sustainability offices and campus communities across the province. Universities have continued to make progress despite budgetary restraints and growing enrolments—environmental sustainability has remained a priority on all campuses.

Plans for the future

In the 2012 survey, there is evidence of a trend towards campus-wide sustainability master planning and ever-increasing student engagement in universities' anticipated activities—a trend which bodes well for maintaining momentum on sustainability. Many incremental improvements are also set to take place across Ontario campuses, including lighting and water retrofits, local food initiatives, expansion of recycling/composting programs, and installation of meters and dashboards for resource-use monitoring.

A final word

Through their survey responses in 2012, universities have demonstrated a clear commitment to continue to work towards environmental sustainability via their campus operations and academic activities. As the 2009 University Presidents' pledge declares, "Ontario universities, ranging in size from small and rural institutions to large and urban ones, began work on the creation of sustainable campuses many years ago, and we continue to demonstrate leadership in advancing a greener world."

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